

SPECIFICATION

TITLE

METHOD AND ELECTRONIC DEVICE FOR CONTROL OF INTERACTIVE GAME

BACKGROUND OF THE INVENTION

[0001] The present invention is related to a method and an electronic device for controlling an interactive game. The concept is based on a video game but with a physical component similar to an attraction. The concept has several levels, in which each user can win points by overcoming sensory tests (enigmas) and tests of skill (challenges). In each level the user is in communication with the control device which at all times directs the performance of the game. The control device establishes the game logic, e.g., the players, matches and scores, control of turns, points, lives, clues, rules of the game, operation of the tests, opening of doors and messages to the player.

[0002] A background of the network that controls the interactive game is disclosed in Spanish patent ES 2 078 152 ("Integrated system of control and data transmission for the administration of multiple peripheral subsystems"), herein incorporated by reference, which discloses a dual ring data network formed by a plurality of nodes interconnected by pairs of main channels and which includes peripheral subsystems connected to each node by way of secondary channels.

[0003] Patent documents are likewise known wherein games are disclosed which carry out sensory tests, such as U.S. Patent No. 5 918 882 which discloses a series of tests relative to the five senses and includes the sixth sense (extrasensory perception). This game consists of a board on which the sense is indicated about which a question will be asked by way of a card (there is a pile of cards for each sense). On answering the questions correctly, the player advances on the board as a function of the difficulty of the question.

[0004] In the state of the art, there are also games which include elements referring exclusively to a single sense. The United States patent numbers 6,149,873 ("Computer game enhancement"), 4,487,585 ("Educational toy having fragrance association means") and 4,687,203 ("Scratch and smell game") concern olfaction,

the sense of smell. U.S. patent no. 6,149,873 consists of an odour-diffusing electromechanical element which serves as a complement for a computer game. U.S. patent no. 4,487,585 discloses an educational game for children which allows elements or forms to be associated with their respective fragrance. The odour is spread when a surface is scratched associated with a piece, which, upon being extracted from its hole, leaves the fragrant surface exposed to the air. U.S. patent no. 4,687,203 is a similar game to the previous one in which a fragrant element associated with each fruit is found under pieces of the same size with drawings of fruits. Each piece is required to be placed in the receptacle with its corresponding smell.

[0005] United States patent nos. 1,877,643 ("Device for testing sensory and mental faculties") and 4,840,374 ("Game utilizing the sense of touch") disclose games in relation with the tactile sense. U.S. patent no. 1,877,643 discloses a set of spheres of different diameter and on a tray with holes of different sizes into which, with the eyes blindfolded, the spheres should be inserted arranged on a basis of the size thereof and the size of the holes. U.S. patent no. 4,840,374 is a game to develop the tactile sense which consists of a hollow cylindrical recipient, open at both ends, in the centre of which is a surface with holes of various shapes through which the player has to pass figures having the shape corresponding to the hole.

[0006] Challenges are tests of skill and physical ability. One such test consists of a room full of balls of different sizes. There is a patent which resembles this challenge, since it also consists of different games with foam balls: International Patent Publication WO97 06867 ("Interactive play structure"). Specifically, this patent document discloses a game space communicated by tunnels, network bridges and ladders. One of the elements is a pool filled with foam balls where the children play and move about in the artificial medium created by the balls. Another element of the game space consists of an actuator which the children work and which puts the foam balls in movement, accelerates them and transports them from one place to another.

SUMMARY OF THE INVENTION

[0007] The present invention is a leisure concept comprising an interactive activity that combines intelligence and physical ability with strong sensory impact. The concept is based on the graphic adventure video games. In the video games existing up to now, the player is limited to acting on the control system by way of an electromechanical element (keyboard or joystick) which creates for him the impression of participating in an adventure in which he really does not form a part. Even in virtual reality video games the player does not cease to be a bystander that remains stationary before what is being perceived visually. The present invention overcomes that limitation since the player is the main character participating in the adventure within a field of play, and, depending upon his skill and ability, will be able to advance in the game. The game also resembles role, labyrinth and amusement park games. The players enter an artificial environment similar to a labyrinth, wherein special film effects are encountered. It is the player who moves physically inside the game and who with his skill has to overcome tests that challenge him both intellectually and physically. In each match, his sensory abilities are put to the test, having to respond correctly to questions in connection with his perceptions. The main character is the user himself, who will advance in the match by moving physically through various stations, confronting sensory tests, tests of ingenuity and tests of skill and ability.

[0008] In an embodiment of the invention, the game may be structured in levels in which tests are included that have to be overcome and which grow progressively in difficulty. Points may be achieved by overcoming tests of skill (challenges), like crossing a room full of balls of different sizes and finding therein an item on a wall or on the floor which wins him points; by means of tests of sensory ability (correctly identifying a smell blown over the user from among four possible answers, correctly identifying an object touched with the fingers without seeing it from among four possible answers, or correctly responding to a question from among four possible answers on some images displayed previously on a screen); or by tests of intelligence by way of an ingenious question, for which he will have to choose one answer from among four possible.

[0009] On each screen the challenges may score as a function of their difficulty, and the enigmas as a function of the established range of difficulty (e.g., the simplest sight, then smell, then touch and, lastly, the most complex ingenuity). It is also possible to win extraordinary points which will be distributed randomly among the players. It is also possible to win a life giving the right to play another match at another time.

[0010] The course of the user through the various tests is directed by the electronic control device. Before beginning to play, the user is provided with an electronic console which identifies him and which locates him at all times within the game. Depending on his ability and ingenuity, he may be guided toward some tests or others by the electronic control device, by way of, e.g., messages in the background sound or through the earphone of his console. The game may include a number of clues which the player can receive through messages in his earphone, by way of symbols over the course of the game or by way of other graphic, written or audible clues. The goal of the user is to leave the multi-activity enclosure alive winning the greatest possible number of points.

[0011] The electronic control device directs the user's interaction with the sensory tests, with the tests of skill, and with the mechanism for channelling the system (opening of doors or messages in corridors). The sealed rooms may act as traffic lights or as controllers of user traffic.

[0012] Each level of the game may be governed by a communication cell comprising a computer (cell PC) and a cell control element. These cell control computers may be connected to a cluster of servers, all of which form a dual ring network, through some switches. Each higher level or cell introduces greater difficulty for the user.

[0013] The sensory tests (enigmas) are directed by a computer for each test. These computers are connected to the dual ring and to the switches by way of, e.g., an RJ45 cable. Each enigma may also have a control element which communicates with the cell control elements to establish the interaction with the persons that are in the system. The enigmas may comprise a screen on which a question is formulated in relation with a sense (sight, touch and smell) or a question of ingenuity. In

addition, they may also have a standard button for each of the possible answers that are displayed on screen, and for which the user has a limited time to respond.

[0014] In an embodiment, the tests of skill comprises activities in which the user has to demonstrate physical ability and astuteness to overcome them, like, e.g., finding an item on a wall in a room filled with balls (like a pool). In this way he obtains a higher score and can advance in the challenge as a whole reaching new tests which allow him to increase his score even more.

[0015] The regulation of the mechanical elements and the communication with user terminals (electronic storage devices, ESD) is carried out through the control elements, which are devices formed by a basic module (microprocessor, a data storage memory, a connector for connection to the network, a power supply, an RF transmitter/receiver with a range of 5 to 10 meters), and, optionally a device actuation relay (for doors) and/or an RF/ID reader. The control elements may be mounted on each door and in each room or passing place. Also, in each cell and in each enigma, one or two control elements will be coupled to the control computer of that cell or enigma.

[0016] The ESDs or consoles have the job of connecting the user with the rest of the mechanisms. These devices may have the following main functions: storing the unique ESD identifier (therefore they position the player carrying that ESD), storing language, time available, lives, points, enigmas and doors; sending/reading data (signals to the central device, signals to control elements - relays or network points - and activation of enigmas); playing messages (the central device may also indicate to the ESD what message it has to play at each moment by way of a numerical identifier, in terms of the route which the player is taking); controlling the turn at the start and messages advising the beginning of the match; control of the conclusion of the match; and finally, monitoring the battery.

[0017] There is a sound system split into two subsystems that are incorporated in each user console and the background sound. The sound incorporated in the console transmits individualized messages to the user through the earpiece of the headphone. These messages are numbered so that at a given time, depending on the status of the user in the tests, the control device will order a

certain message to be played. These messages are what direct the user when different options exist (several enigmas in the same room or several exit doors out of a room), or to facilitate his interaction with the game. The system of background sound is present throughout the course and, at certain points, sequences triggered by the user will be emitted. A computer is in charge of managing the background sound and the interaction with the user is carried out through the control elements.

[0018] In an embodiment, at the game entrance or waiting area, there can be a group of giant screens where: images may be projected in real time from several cameras inside, short pre-recordings in digital format may be provided, flash ensembles and scores obtained from the central device may also be provided. These screens may be driven by a computer and a switching matrix.

[0019] The dual ring optical fiber network can be used for maintenance and monitoring of the control device. The central device may supervise the correct operation of the electronics and, in the event of one of the elements not working, it can activate the possible redundant element and will transmit an alarm signal.

DESCRIPTION OF THE DRAWINGS

[0020] To complete the description and with the object of assisting in a better understanding of the characteristics of the invention, in accordance with an example of an embodiment thereof, the description is accompanied with a set of drawings in which, by way of illustration and not restrictively, the following has been represented:

Figure 1 is a pictorial schematic diagram showing the distribution of the control network 14 with the servers 6 and the switches 7, the cell control computers 1 - 5 and their control elements 8, as well as the enigma control computers 1' - 51' together with their control elements 10. A user console 12, 13 is also shown interacting with the control element of a cell, and a relay 11 acting in the opening of a door from the control element of an enigma 10;

Figure 2 is a pictorial illustration showing a preferred embodiment of the user console 12 with the default display of the points obtained by the user, the lives and the time available; and

Figure 3 is a pictorial illustration showing a preferred embodiment of the user console 13 with the display which appears temporarily when the user brings the console near to the activation device of an enigma. The obtained points, lives and enigmas are shown by way of a graphic associated with each type of enigma (touch, smell, sight and ingenuity).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] The preferred embodiment of the control device of the interactive game is conceived for indoor premises.

[0022] The device may include several redundant elements to enhance the reliability of the system and of the communications. The dual ring network 14 may be implemented in optical fiber. The servers 6 – the central device - form a cluster. In addition, the information of these servers is periodically replicated in the enigma control computers 1'-51' and in the cell control computers 1 - 5, in such to way that if both servers fail, any one of the enigma or cell PCs could take the role of server. In the preferred embodiment of the system, the cluster of servers 6 are formed by two computers. The servers monitor the correct operation of all the elements of the control device. A distributed control can be implemented. The whole network may be subdivided into individual sub-networks - communication cells - controlled by a PC 1 - 5.

[0023] The number of communication cells in the preferred embodiment is five, which correspond to the five levels of the game. The cell PCs 1 - 5 also include a certain redundancy since they can replace each other. If one fails, control may be taken by any one of the other four – that which is designated by programming. If another fails, the following one would replace it, and so on until hypothetically the five fail, at which time the two servers of the cluster 6 could take control of the cells.

[0024] The control cell elements 8 may be duplicated in each cell computer. If a complete point fails (the two that constitute it), control of that cell may be taken by the cell control element indicated by programming. This is achieved by automatically boosting the communication power to have a greater range. If all the cell control

points fail (the ten elements), control could be taken by the servers 6, which can also act as cell control elements.

[0025] The control elements 10 are almost all duplicated (on doors, in rooms, passing places, and enigmas). Their connection to their cell control element 8 may be by radio 9. At each point, both are active, and a break in the communication with the cell control element 8, and finally with the server 6, could be controlled by the communication protocol, in order to re-establish communication through the second control element of that point. The embodiments of the control elements can be the following: for control of doors 11, they may be formed by the basic module (comprising a microprocessor, data storage memory, power supply and RF transmitter/receiver with a range of 5 to 10 meters) and an actuation relay; for control of rooms, they may be formed by the basic module and the RF transmitter/receiver; for control of passing places, they may be formed by the basic module and the RF transmitter/receiver; and for control of enigmas, they may be formed by the basic module and a presence detector, to which the user has to bring his console 12 near.

[0026] In the enigmas, in an embodiment, there is a single computer 1' - 51', but with two communication paths, one via cable (two network cards connected to ring 1 and to ring 2), and another by radio. This allows connection by cable to the cell PCs 1 - 5, and by radio to the control elements and the cell control elements 8. The enigmas are sensory tests which are presented to the user. There are four types of enigma. The sight enigmas comprise some binoculars in the wall from which a screen is observed, where images will be projected about which a question is subsequently formulated to the user. The smell enigmas have a circle with holes through which the fragrance diffuses and a control element of the fragrance machine. The tactile enigmas comprise an access hole to a mitten and a vending type dispenser which rotates in order to put different objects within the reach of the user. These three types of enigma also have a screen to formulate the pertinent question, four mushroom type buttons and an activation point which starts up the enigma when the user brings his console 12 near. The ingenuity enigmas are formed only by the screen, the buttons and the activation point.

[0027] The switches 7, which serve as network outlets, are duplicated, and are connected over the ring.

[0028] According to Figure 2, the console or storage device 12 in this particular embodiment of this invention has the form of a wrist watch. Its purpose is to connect the user with the rest of the control device. The consoles 12 may comprise one or more of a case, a microprocessor, a data storage memory, a backlit information display viewer, RTC (real time clock) chronometer, RF (radio-frequency) emitter, RF (radio-frequency) receiver, acoustic warning beeper, RF/ID transponder - identifier, similar to the anti-theft control in shops, MP3 message player, MMC (Multimedia Card), headphone for a single ear and rechargeable batteries. The communication between the console and the rest of the device may be carried out through the RF transmitter/receiver or through the RF/ID transponder. The backlit information display viewer has 64x16 pixels in the present preferred embodiment. The points counter may have seven digits. The preferred presentations of the viewer show the chronometer and the score (default presentation of the viewer) 12, or the score, the lives (possibility to obtain an extra life that will give the right to a new session) and the enigmas overcome (visible for a time when the console is recognized by the control element of an enigma when brought near to the sensor) 13.

[0029] The cable of the headphone may have a distinguishing color depending on whether the user is a child or an adult, in order to adapt the tests of the game to the type of user by way of different consoles, and therefore different difficulty in the tests of ingenuity. The system of background sound may be present over the whole course of the leisure concept. A computer may be in charge of managing the background sound and the interaction with the user. In some of the enigmas of ingenuity, images can be presented in 3D instead of the images of the computer screen using holographic projectors 6 that may be connected to the network. They may have a holographic appearance, contributing greater realism to the user's sensations when interacting with the tests.

[0030] In an embodiment, all the information with respect to the control device of the game may be stored in a database. The information which will be stored may

include information about the players and the matches. Information will be stored for managing the control device: enigma tests, points to be granted, extra score, extra lives, the messages to the headphone, and the routes inside the game. And finally, administration information can be stored like that relative to ticket sales, reservations (via internet), statistics and accounting. The database may be in the central control cluster or central control device.

[0031] The central control device 6 may be connected to different external elements. It may be connected to the mechanical elements like doors 11 or challenges. It may likewise be connected to the light and sound system. Another external element connected to the central device may be the accounting system, from which the business accounting is managed. It may also be connected with the web through a gateway, where home sales can be facilitated or the possibility of continuing with the game. Finally, the central control device may be connected with an SMS system through a bidirectional gateway, as another way of continuing the game.

[0032] For the purposes of promoting an understanding of the principles of the invention, reference has been made to the preferred embodiments illustrated in the drawings, and specific language has been used to describe these embodiments. However, no limitation of the scope of the invention is intended by this specific language, and the invention should be construed to encompass all embodiments that would normally occur to one of ordinary skill in the art.

[0033] The present invention may be described in terms of functional block components and various processing steps. Such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit components, e.g., memory elements, processing elements, logic elements, look-up tables, and the like, which may carry out a variety of functions under the control of one or more microprocessors or other control devices. Similarly, where the elements of the present invention are implemented using software programming or software elements the invention may be implemented with any programming or scripting language such as C, C++, Java, assembler, or the like,

with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Furthermore, the present invention could employ any number of conventional techniques for electronics configuration, signal processing and/or control, data processing and the like.

[0034] The particular implementations shown and described herein are illustrative examples of the invention and are not intended to otherwise limit the scope of the invention in any way. For the sake of brevity, conventional electronics, control systems, software development and other functional aspects of the systems (and components of the individual operating components of the systems) may not be described in detail. Furthermore, the connecting lines, or connectors shown in the various figures presented are intended to represent exemplary functional relationships and/or physical or logical couplings between the various elements. It should be noted that many alternative or additional functional relationships, physical connections or logical connections may be present in a practical device. Moreover, no item or component is essential to the practice of the invention unless the element is specifically described as "essential" or "critical". Numerous modifications and adaptations will be readily apparent to those skilled in this art without departing from the spirit and scope of the present invention.

ABSTRACT

An electronic device for control of an interactive game is provided in which the user advances by way of overcoming sensory tests (sight, touch, smell and ingenuity) and tests of skill. The control device is organized based on a data network, with a server element, a switch element, several cell control computers (sub-network) and other enigma control computers (sensory tests). The user actions, through an electronic console which identifies him, are detected by the control elements governed by microprocessor, which communicate them to the central device in order to interact again with the user by way of sound messages over the background sound system of the game or through the headphone that each user console incorporates.